

Depletion of potassium which sometimes results from zealous use of oral diuretics has resulted in an increasing number of patients with signs of toxicity.

Bradycardia and first-degree A-V block may occur with the administration of excessive amounts of digitalis. The older patient is sometimes particularly sensitive to digitalis and may require *very* small amounts.

Infrequent idiosyncrasies to digitalis include

trigeminal neuralgia, paresthesias, retrobulbar neuritis, gynecomastia, urticaria, thrombocytopenia and delirium.

The choice of preparation should depend on the patient's requirements and the physician's familiarity with a preparation which is consistent in quality and economical in price. A recent study in the United States showed that the price for equal lots of digitalis preparations of equal strength from different sources ranged from \$1.55 to \$13.50.

SHORT COMMUNICATION

Hospital Facilities for the Management of Acute Cardiorespiratory Failure

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GREATLY improved techniques of cardiorespiratory resuscitation have been developed in the past few years.¹⁻⁴ These techniques are most effective when personnel are fully familiar with their minutiae and when satisfactory equipment is available for their application. Conditions amenable to these methods include reversible disorders complicated by cardiac arrest, and the various causes of acute respiratory insufficiency. The purpose of this communication is to outline the provisions which have been made at the Toronto General Hospital for the management of these situations.

EQUIPMENT

Each ward and the Outpatient and Emergency Departments of the hospital have been provided with a small case (Fig. 1) containing sufficient

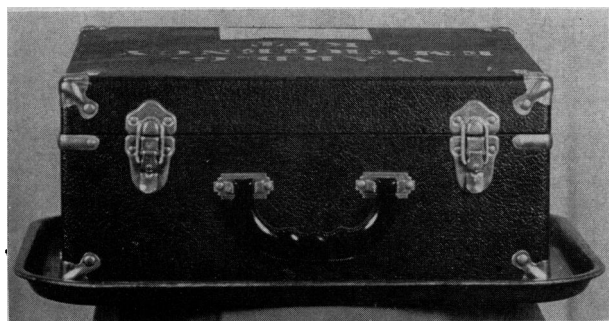


Fig. 1.—Emergency box with standard kitchen tray. Small inner compartment separates drugs and syringes from other items.

equipment to establish an airway, to provide adequate ventilation and oxygenation, and to treat many of the causative conditions responsible for

ABSTRACT

A description is given of the arrangements made in a large Canadian teaching hospital for the management of acute respiratory failure and of cardiac arrest. Each ward is provided with a case containing a selection of drugs, a bag and mask for intermittent positive pressure respiration, a laryngoscope and endotracheal tubes. In such emergencies, key personnel are called on the hospital public address system as soon as the switchboard is informed of the location of the patient concerned. A resuscitation training program for medical students, interns and nurses has been instituted.

acute cardiorespiratory failure (Fig. 2). Sufficient drugs are provided to initiate treatment but, to retain simplicity, only one ampoule or vial of most



Fig. 2.—Major items of equipment included in emergency box. Numbers refer to Table I.

TABLE I.—CONTENTS OF EMERGENCY BOX

Equipment:

- (1) Pulmonator bag.
 - (2) Face mask to fit (1).
 - (3) Oropharyngeal airway, size No. 3.
 - (4) Macintosh laryngoscope with spare batteries and bulb.
 - (5) Endotracheal catheter mount connector to fit (1), when endotracheal tube is used.
 - (6) One 8-mm. and one 9.5-mm. cuffed endotracheal tube, with No. 3 and No. 4 suction T-piece to fit.
 - (7) Unsterile 10-ml. syringe, inflating cannula and hemostat, for inflation of cuff on endotracheal tube.
 - (8) One sterile No. 21 spinal needle, 5 inches long, for intracardiac injections.
 - (9) One sterile scalpel.
- Other items included, but not shown in Fig. 1, are:
- (10) One metal mouth suction piece.
 - (11) One each: sterile 5-ml., 10-ml. and 50-ml. syringes.
 - (12) One each: sterile No. 15, 18 and 21 needles.

Drugs

- (1) One vial succinylcholine chloride.
- (2) One ampoule atropine sulfate—0.6 mg.
- (3) One ampoule adrenaline hydrochloride, 1 : 1000.
- (4) One ampoule 10% calcium gluconate—10 ml.
- (5) One vial procaine amide—10 ml.
- (6) One ampoule methylamphetamine—30 mg.
- (7) One vial prednisolone soluble—50 mg.
- (8) One vial distilled water for injection (as solvent for prednisolone).
- (9) One ampoule isopropyl-noradrenaline, 1 : 5000.
- (10) Four ampoules 5% sodium bicarbonate—50 ml.
- (11) One tube anesthetic lubricant.

N.B.—This equipment is intended for use with adult patients only. Additional sizes of endotracheal tubes and a No. 1 oropharyngeal airway should be included in institutions handling pediatric patients.

agents is included (Table I). The contents of each case are checked regularly and the need for each item is reviewed from time to time in the light of current concepts. Each emergency kit includes a standard kitchen tray which can be placed transversely under the patient's chest, upside down, should external cardiac massage be necessary. Each ward and department is provided with a list of the telephone extension numbers of locations where additional emergency equipment may be obtained. This list is posted beside the telephone and includes the locations of such items as defibrillators, portable electrocardiographic (ECG) machines, bronchoscopes, and tracheotomy and cardiac arrest trays for internal cardiac massage.

PERSONNEL AND TRAINING

When a cardiorespiratory emergency occurs, the locating telephone operator is informed of its location and she immediately calls the assistant resident responsible for the patient, the resident anesthetist, the medical resident and the nursing supervisor for the appropriate section of the hospital. Nursing supervisors have been most useful in obtaining sufficient nursing assistance when such an emergency arises.

The provision of equipment is of little value if all personnel are not trained in its use. Arrangements have been made to ensure maximum familiarity with the problem, and an attempt has been made to instruct personnel at various levels of training. Thus, medical students are instructed in

the principles involved, and the equipment and techniques are demonstrated to junior interns at the beginning of their year. Those junior interns rotating through the Anesthesia Service are taught the principles of airway control and ventilation in greater detail. Student nurses receive instruction in acute cardiorespiratory failure and its management, during their first year of training. However, maximum success will only be achieved when those who are constantly with the patients are proficient in resuscitation techniques. This involves two considerations: (a) training of graduate nurses and (b) centralizing the most seriously ill patients in order that advantage may be taken of accumulated experience and of monitoring facilities.

(a) *Training of graduate nurses.*—Twelve members of the senior nursing staff have received lecture-demonstrations in the principles of external cardiac massage and of artificial ventilation by intermittent positive pressure. Each has practised ventilation with airway, bag and mask on curarized anesthetized subjects. This group, in turn, has given lecture-demonstrations to the entire graduate nursing staff and, in addition, provides a weekly demonstration for any new staff members who have not received such instruction.

(b) *Centralization.*—Five special areas in the hospital have been established for the management of patients with particular types of disorders—neurosurgical cases, postoperative cardiac surgical cases, and patients with respiratory insufficiency, coronary thrombosis and renal failure.

LONG-TERM FACILITIES

Following resuscitation, the long-term outlook for many patients will depend on the availability of efficient intensive-care facilities. In such cases, the development of further cardiorespiratory failure is a strong possibility, and complications of the initial episode, such as posthypoxic cerebral edema and renal shut-down, require special measures. Controlled hypothermia, mechanical positive-negative phase hyperventilation and osmotic diuretics, or, possibly, dialysis may all be necessary. Centralization of patients will assist in the efficient application of these measures.

SUMMARY

The special arrangements for the management of acute cardiorespiratory failure, instituted at the Toronto General Hospital, have been described. These have resulted in a greatly increased awareness of such problems throughout the hospital and, already, a number of patients have been successfully resuscitated from proved cardiac arrest and from various types of acute respiratory difficulty. In some instances, members of the nursing staff have instituted ventilation and external cardiac massage, with survival of the patient.

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